A New Species of *Lycoris* (Amaryllidaceae) from Hunan, China

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ABSTRACT. A new species, *Lycoris hunanensis* M. H. Quan, L. J. Ou & C. W. She (Amaryllidaceae), is described from Yuanling County in Hunan Province, China. Diagnostic morphological characters that distinguish it from the similar *L. straminea* Lindl. are presented. The clearest differences are that the perianth of *L. hunanensis* is pink in bud, lightly yellowish pink in early anthesis, and gradually fading to white later in development, with light red spots apically, while that of *L. straminea* is always ocher-yellow. *Lycoris hunanensis* has longer scapes (50–60 cm vs. ca. 35 cm long in *L. straminea*). The leaf apex of *L. hunanensis* is acuminate, which is quite different from the obtuse apex of *L. straminea*, and the leaf blade midveins are noticeably paler in *L. straminea*. The new species is assessed as Endangered (EN), according to IUCN criteria.

Key words: Amaryllidaceae, China, Hunan, IUCN Red List, *Lycoris*.

Lycoris Herb. is a small genus with ca. 20 species in the family Amaryllidaceae (Hsu & Siro, 1994) that is mainly distributed in China, Japan, and Korea and seldom occurs in Burma, Nepal, and Indonesia (Hsu & Fan, 1974; Yang, 1976). China is richest in *Lycoris* species, with 15 species and two varieties, which are mostly distributed in the Zhejiang, Jiangsu, and Anhui provinces in eastern China (Xu et al., 1985; Yuan et al., 2008). During a botanical expedition to Yuanling County in Hunan Province in August 2009, we collected an unusual plant of *Lycoris*. This 2009 collection provided insufficient material for conclusive identification, but in 2010 we collected additional material of this species in Yuanling County, and we now have quite a few living plants at the botanical garden of Huaihua University, where they have come into bloom every year since 2009. Detailed literature studies and comparisons of almost all *Lycoris* species in China at the Hangzhou Botanical Garden and the Nanjing Botanical Garden Memorial Sun Yat-Sen reveal that this species is indeed similar to *L. straminea* Lindl. but remarkably different in its flower characters and leaf shape. In fact, these characters are quite distinctive in the genus and are critical in determining its taxonomy (Fig. 1). The new species is distinguished from *L. straminea* by characters of the perianth, scape, and leaf. A taxonomic key to the *Lycoris* species from Hunan Province in China, based on the essential details of the flowers and leaf, is provided below.

Lycoris hunanensis M. H. Quan, L. J. Ou & C. W. She, sp. nov. TYPE: China. Hunan: Yuanling Co., Zhuhongxi, moist surroundings, 110°38′E, 28°43′N, 200–350 m, 7 Oct. 2009, *M. H. Quan 09007* (holotype, Huaihua University). Figure 1.

Species *Lycoridi stramineae* Lindl. similis, sed ab ea scapo 50–60 cm longo, folio ensiformi 36–39 × 1.3–1.5 cm apice acuminato atque flore per anthesin colore mutabili (primo roseo deinde pallide luteoroseo demum albo) differt.

Herbs perennial; bulbs subglobose, 3–5 cm diam., 4–6 cm, with purple-brown epidermis. Leaves 5 to 7, ensiform, 36–39 × 1.3–1.5 cm, apex acuminate, dark green; leaf midvein not distinctly paler. Scapes 50–60 cm, 10 mm diam.; involucral bracts 2, each 4–5 × 1.4–1.6 cm, lanceolate, membranous, light green, apex acuminate, direction changing in bloom. Flowers 6 to 7 per umbel, floral tube 1–1.2 cm; perianth with 6 tepals, 5–6 cm × 6–8 mm, erect in bud, later in development strongly recurved, tepal margin strongly undulate, pink in bud, lightly yellowish pink in early anthesis, later in development gradually fading to white, with scattered pink stripes adaxially and light red spots apically that gradually disappear at anthesis, and faint yellow midvein abaxially; pedicel 0.6–1 cm; stamens 6, filaments white but faintly fuchsia apically, 8–9 cm, about 1/3 longer than the perianth; anther red-brown, 6–7 × 0.8–1 mm; pistil 1, style linear, white but faint fuchsia apically; ovary hypogynous, about 5 mm, green, subspheroidal. Fruit a 3-valved capsule; seeds black, subspheroidal or hemispherical.

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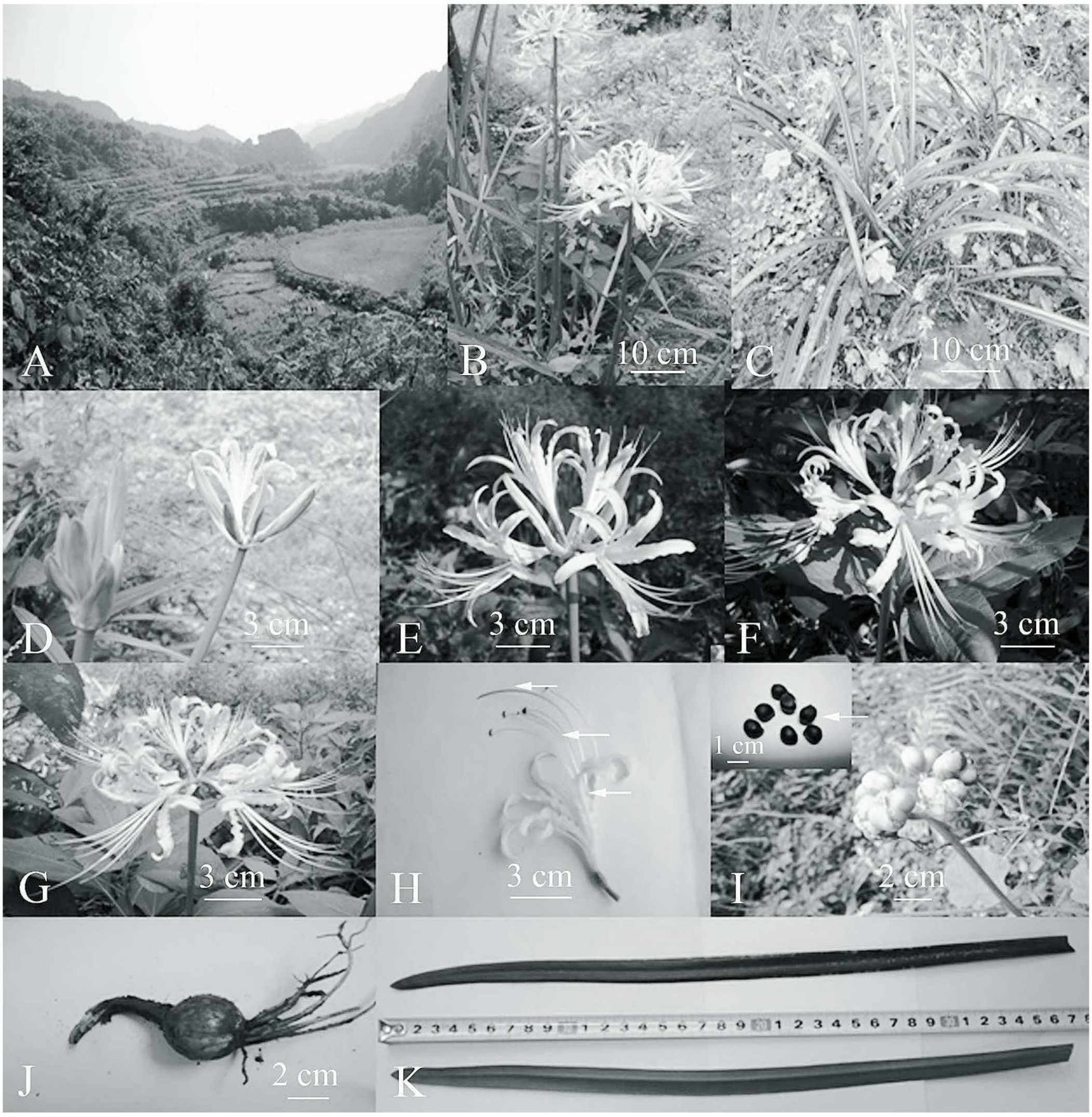

Figure 1. *Lycoris hunanensis* M. H. Quan, L. J. Ou & C. W. She. —A. Habitat at Zhuhongxi. —B. Type population, with three flowering scapes visible. —C. Vegetative habit. —D. Floral buds on umbel, with one flower beginning anthesis. —E. Flower in early anthesis. —F. Flower in mid-anthesis. —G. Flower in last stages of anthesis. —H. Flower perianth (bottom arrow), stamen (middle arrow), and pistil (top arrow). —I. Fruit (lower right) and seeds (arrow, upper left). —J. Bulb. —K. Adaxial leaf blade surface (top) and abaxial leaf blade surface (bottom). Photographs by M. H. Quan, 2010, taken in Zhuhongxi.

Distribution and habitat. *Lycoris hunanensis* occurs in Yuanling County, Hunan Province, China, growing in small riparian areas from 200 to 350 m in elevation, 110°38′–110°41′E, 28°37′–28°43′N.

IUCN Red List category. Because habitat has gradually declined for *Lycoris hunanensis* and the species is endemic to stream habitats, it should be considered Endangered (EN), according to IUCN Red List criteria (IUCN, 2001). Strict conservation measures to safeguard the known populations are urgently needed. *Lycoris hunanensis* grows in small riparian areas of Zhuhongxi in Hunan Province.

Phenology. The leaves of *Lycoris hunanensis* appear in September; flowering occurs from the end of August to September, and fruiting occurs from October to November.

Discussion. *Lycoris hunanensis* is similar to *L. straminea*, with several characters in common, including season of leaf appearance, leaf width,

recurved perianth lobes, with undulate margin, adaxial perianth with scattered pink stripes, and stamens 1/3 longer than the perianth. The two taxa differ in that the perianth color of *L. hunanensis* gradually changes in anthesis, which is pink in bud, lightly yellowish pink in early anthesis, and later in development gradually fading to white, with light red spots apically. The tepal midvein is faintly yellow abaxially in *L. hunanensis*, while that of *L. straminea* is always ocher-yellow; *L. hunanensis* has a much longer scape, from 50 to 60 cm, while that of *L.* MO).

straminea is ca. 35 cm. Finally, the leaf shape of *L. hunanensis* is ensiform, its apex is acuminate, while that of *L. straminea* is ligulate, its apex is obtuse, which remarkably differs. The midvein is distinctly paler on the green blade in *L. straminea*, a characteristic that is not seen in the entirely dark green blades of the new species.

Paratype. CHINA. **Hunan:** Yuanling Co., Zhuhongxi, 30 Aug. 2010, *M. H. Quan 201003* (Huaihua University,

KEY TO THE SPECIES OF *LYCORIS* FROM CHINA (ADAPTED FROM JI & MEEROW, 2000: 266)

1a. Flowers actinomorphic; perianth lobes apically slightly recurved, margin basally minutely undulate or not undulate 2
2a. Margin of perianth lobes not undulate along entire length 3
3a. Perianth pale purple but apically blue, tube 1–1.5 cm; leaves ca. 1 cm wide ..... *L. sprengeri* Comes ex Baker
3b. Perianth white or yellow, tube 4–6 cm; leaves 1.5–2 cm wide ..... *L. longituba* Y. Xu & G. J. Fan
2b. Margin of perianth lobes basally minutely undulate 4
4a. Leaves first appearing in autumn and then reappearing in spring; perianth purple ..... *L. squamigera* Maxim.
4b. Leaves appearing in spring; perianth yellow or white 5
5a. Perianth always yellow, tube 2.5–3.5 cm; leaves ca. 2 cm wide ..... *L. anhuiensis* Y. Xu & G. J. Fan
5b. Perianth white, later in development gradually changing to yellowish pink, tube ca. 1 cm; leaves ca. 1.2 cm wide ..... *L. incarnata* Comes ex Sprenger
1b. Flowers zygomorphic; perianth lobes recurved, margin everywhere undulate 6
6a. Leaves appearing in autumn; stamens obviously longer than perianth 7
7a. Stamens 1/6 longer than perianth, perianth yellow or light rose-red 8
8a. Perianth yellow; leaves ensiform, ca. 60 × 2 cm, apex acuminate ..... *L. aurea* (L'Hér.) Herb.
8b. Perianth light rose-red; leaves ligulate, ca. 20 × 1 cm, apex rounded ..... *L. rosea* Traub & Moldenke
7b. Stamens 1/3 longer to twice the length of the perianth, perianth bright red, white, ocher-yellow, or discolored 9
9a. Stamens twice the length of the perianth, perianth bright red; leaves narrowly ligulate, ca. 0.5 cm wide ..... *L. radiata* (L'Hér.) Herb.
9b. Stamens 1/3 longer than perianth, perianth white, ocher-yellow, or discolored; leaves ligulate or ensiform, 1.2–1.5 cm wide 10
10a. Perianth pink in bud, becoming lightly yellowish pink in early anthesis, then gradually fading to white, adaxially with scattered pink stripes, abaxially with faint yellow midvein; leaves ensiform, dark green, 36–39 × 1.3–1.5 cm, apex acuminate ..... *L. hunanensis*
10b. Perianth white or ocher-yellow, adaxially with or without scattered pink stripes, abaxially with green midvein; leaves ligulate, green or dark green, ca. 30 × 1.2–1.5 cm, apex obtuse 11
11a. Perianth ocher-yellow, adaxially with scattered pink stripes; leaves green, ca. 1.5 cm wide ..... *L. straminea*
11b. Perianth white, adaxially without scattered pink stripes; leaves dark green, ca. 1.2 cm wide ..... *L. houdyshelii* Traub
6b. Leaves appearing in spring; stamens shorter to slightly longer than perianth 12
12a. Stamens shorter than perianth; leaf midvein not distinctly pale 13
13a. Perianth pink in bud, becoming creamy at anthesis, then gradually fading to white, lobes without pink stripes ..... *L. caldwellii* Traub
13b. Perianth white with red stripes in bud, fading to white at anthesis, lobes adaxially with scattered pink stripes ..... *L. shaanxiensis* Y. Hsu & Z. B. Hu
12b. Stamens nearly as long as to slightly longer than perianth; leaf midvein distinctly pale (except in *L. albiflora* Koidz.) 14
14a. Perianth pink in bud, becoming creamy as buds develop, then gradually fading to white, lobes adaxially with scattered pink stripes, abaxially with pink midvein ..... *L. albiflora*
14b. Perianth yellow, lobes adaxially with or without stripes or spots 15
15a. Perianth lobes adaxially without red stripes; leaves green, ligulate, ca. 35 × 2 cm ..... *L. chinensis* Traub
15b. Perianth lobes adaxially with red stripes or brushlike spots; leaves dark green, narrowly ligulate, 24–29 × 1–1.2 cm ..... *L. guangxiensis* Y. Xu & G. J. Fan

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